

Linear Model Equation Practice

Metadata available at: <https://stacyderuiter.github.io/stat245-fa24/tehran-glucose-meta.html>

```
chol_model <- lm(total_cholesterol ~ age,  
                 data = TGS)  
summary(chol_model)
```

Call:

```
lm(formula = total_cholesterol ~ age, data = TGS)
```

Residuals:

Min	1Q	Median	3Q	Max
-3.9314	-0.6492	-0.0245	0.6419	3.9595

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	4.9255885	0.0448688	109.778	< 2e-16 ***
age	0.0022937	0.0008642	2.654	0.00797 **

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.9739 on 7716 degrees of freedom

Multiple R-squared: 0.0009122, Adjusted R-squared: 0.0007827

F-statistic: 7.045 on 1 and 7716 DF, p-value: 0.007966

1. What are the predictor and response variables?
2. What question can this model answer?
3. Write the model equation, using information from the model `summary()`.

```
bp_model <- lm(SBP ~ triglyceride,
               data = TGS)
summary(bp_model)
```

Call:

```
lm(formula = SBP ~ triglyceride, data = TGS)
```

Residuals:

Min	1Q	Median	3Q	Max
-49.795	-12.732	-0.556	12.139	59.211

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	116.1229	0.4798	242.041	< 2e-16 ***
triglyceride	1.6257	0.2438	6.668	2.77e-11 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 18.33 on 7716 degrees of freedom

Multiple R-squared: 0.005729, Adjusted R-squared: 0.0056

F-statistic: 44.46 on 1 and 7716 DF, p-value: 2.773e-11

1. What are the predictor and response variables?
2. What question can this model answer?
3. Write the model equation, using information from the model `summary()`.

```
tri_model <- lm(triglyceride ~ age,
               data = TGS)
summary(tri_model)
```

Call:

```
lm(formula = triglyceride ~ age, data = TGS)
```

Residuals:

Min	1Q	Median	3Q	Max
-1.2279	-0.6347	-0.2579	0.4028	3.6682

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	1.4815691	0.0392847	37.71	< 2e-16 ***
age	0.0057727	0.0007566	7.63	2.64e-14 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.8527 on 7716 degrees of freedom

Multiple R-squared: 0.007488, Adjusted R-squared: 0.007359

F-statistic: 58.21 on 1 and 7716 DF, p-value: 2.638e-14

1. What are the predictor and response variables?
2. What question can this model answer?
3. Write the model equation, using information from the model `summary()`.

```
tri_model2 <- lm(triglyceride ~ total_cholesterol,
                 data = TGS)
summary(tri_model2)
```

Call:

```
lm(formula = triglyceride ~ total_cholesterol, data = TGS)
```

Residuals:

Min	1Q	Median	3Q	Max
-1.2382	-0.6375	-0.2611	0.4052	3.6641

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	1.72025	0.05134	33.506	<2e-16 ***
total_cholesterol	0.01027	0.01000	1.027	0.305

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.8558 on 7716 degrees of freedom

Multiple R-squared: 0.0001366, Adjusted R-squared: 6.991e-06

F-statistic: 1.054 on 1 and 7716 DF, p-value: 0.3046

1. What are the predictor and response variables?
2. What question can this model answer?
3. Write the model equation, using information from the model `summary()`.

```
bmi_model <- lm(BMI ~ age,
                data = TGS)
summary(bmi_model)
```

Call:

```
lm(formula = BMI ~ age, data = TGS)
```

Residuals:

Min	1Q	Median	3Q	Max
-43.138	-3.800	-0.309	3.226	54.031

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	27.390979	0.358423	76.421	< 2e-16 ***
age	0.022622	0.006903	3.277	0.00105 **

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 7.78 on 7716 degrees of freedom

Multiple R-squared: 0.00139, Adjusted R-squared: 0.00126

F-statistic: 10.74 on 1 and 7716 DF, p-value: 0.001054

1. What are the predictor and response variables?
2. What question can this model answer?
3. Write the model equation, using information from the model `summary()`.

```
whr_model <- lm(SBP ~ WHR100,
                data = TGS)
summary(whr_model)
```

Call:

```
lm(formula = SBP ~ WHR100, data = TGS)
```

Residuals:

Min	1Q	Median	3Q	Max
-52.844	-12.887	-0.421	12.161	62.278

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	83.92289	2.59452	32.35	<2e-16 ***
WHR100	0.36919	0.02722	13.56	<2e-16 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 18.17 on 7716 degrees of freedom

Multiple R-squared: 0.02329, Adjusted R-squared: 0.02316

F-statistic: 184 on 1 and 7716 DF, p-value: < 2.2e-16

1. What are the predictor and response variables?
2. What question can this model answer?
3. Write the model equation, using information from the model `summary()`.